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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/812,450	03/30/2004	Amitava Sengupta	2000.180	3166

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EXAMINER	
MENON, KRISHNAN S	
ART UNIT	**PAPER NUMBER**
1723	

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07/31/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/812,450	SENGUPTA ET AL.	
	Examiner	Art Unit	
	Krishnan S. Menon	1723	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 July 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-8 and 10-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-8 and 10-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claims 1,3-8 and 10-22 are pending as amended in the RCE of 7/23/07.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claims 1,3-8 and 10-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cho et al (US 6,616,841), with evidence from Kuzumoto (US 4,623,460); and alternately, over Kuzumoto in view of Cho.

Cho teaches a hollow fiber membrane cartridge and a system for degassing as claimed – see figures, especially figure 4. The membrane is in the form of a fabric (abstract), and is wound around the perforated core (12). The membrane lumen is open only on one end in figure 4. The core is plugged on one end (by the tube sheet (26), but is not the same end as claimed, which eliminates the "first" end cap in the reference figure 4. However, this difference in the claims is only an obvious equivalent of the teaching of the reference unless applicant can show otherwise, with evidence. An express suggestion to substitute one equivalent component or process for another is not necessary to render such substitution obvious. In re Fout, 675 F.2d 297, 213 USPQ 532 (CCPA 1982). This construction of having the perforated tube plugged at the first

end cap and attached from the second end cap, and lumen of the hollow fibers open at the first end cap is taught by Kuzumoto (US 4,623,460), and is already known in the art.

With respect to the newly added limitation in the RCE of 7/23/07, i.e., the first and second head spaces, Cho's figure 4 does not show an end cap on the end, and therefore the second head space, where the lumen of the hollow fibers are closed, because an end cap is not necessary at that end. Thus, Cho's end cap (15) is exclusive to the open end of the lumen of the hollow fibers. An end cap can be added to the end where the lumen of the hollow fibers are closed, if one were to change the orientation of the feed inlet tube (20) to have the feed inlet form that end, as is contemplated by the applicant, which would be obvious to one of ordinary skill in the art. Such design is also known in the prior arts, as evidence by Kuzumoto. It is also not patentable: a mere reversal of parts (In re Gazda 219 F.2d 449. 104 USPQ 400 (CCPA 1955) or rearrangement of parts (In re Japikse, 181 F.2d 1019, 86 USPQ 70 (CCPA 1950) and In re Kuhle, 526 F.2d 553, 188 USPQ 7 (CCPA 1975) is unpatentable.

The Cho reference teaches a system for degassing as claimed. The recitation of the liquid in the claim is not a patentable limitation. "Expressions relating the apparatus to contents thereof during an intended operation are of no significance in determining patentability of the apparatus claim." Ex parte Thibault, 164 USPQ 666, 667 (Bd. App. 1969). Furthermore, "[i]nclusion of material or article worked upon by a structure being claimed does not impart patentability to the claims." In re Young, 75 F.2d 966, 25 USPQ 69 (CCPA 1935) (as restated in In re Otto,, 312 F.2d 937, 136 USPQ 458, 459 (CCPA 1963)).

The material of the shell, end caps, tube sheets, and plug being of the same material such as polyethylene is well known in the art as taught by Cho, and the reference incorporated by Cho (column 1 lines 8-12: US Patent 5,284,584: Huang et al: see abstract and column 1 lines 10-28 and column 5 lines 10-29: tube sheet, and other components of the cartridge made from polyolefin).

The dimensions such as length and diameter are not patentable limitations. *In re Rose* , 220 F.2d 459, 105 USPQ 237 (CCPA 1955) (Claims directed to a lumber package "of appreciable size and weight requiring handling by a lift truck" where held unpatentable over prior art lumber packages which could be lifted by hand because limitations relating to the size of the package were not sufficient to patentably distinguish over the prior art.); In re Rinehart, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976) ("mere scaling up of a prior art process capable of being scaled up, if such were the case, would not establish patentability in a claim to an old process so scaled." 531 F.2d at 1053, 189 USPQ at 148.). *In Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984), the Federal Circuit held that, where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art.

The baffle (claims 6,13) in the cartridge is taught by the reference – see baffle 50, figure 3. While figure 4 may not be showing the baffle, it would be obvious to one of ordinary skill in the art at the time of invention to have the baffle for the reason

suggested by the reference, i.e., distribution of the fluids around the hollow fibers – see column 4 lines 40-45.

End caps welded to the shell is also not patentable – it is a process limitation in the product claim. "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." In re *Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

Finally, "for introducing a gas into a liquid" in claim 14 is an intended use limitation. A claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. *Ex parte Masham*, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987). Liquid and gas recited are contents in the apparatus for the process: Ex parte Thibault. Using hollow fibers to gasify a liquid is also known in the art as evidenced by Katou, et al (US 6,158,721).

Regarding claims 15 – 18, the shell opening in figure 4 is equivalent to the claimed shell opening at the mid point. Applicant has not disclosed any criticality of having the shell opening exactly at the mid point of the shell, instead of what is taught by figure 4.

Claims 19-22 are broader than the corresponding claims 1, 7,8 and 14, and are unpatentable as shown.

Alternately, the claims are unpatentable over Kuzumoto in view of Cho.

Kuzumoto teaches a cartridge (figure 1) with a shell, first end cap (at 5) with first tube sheet (3), hollow fibers with lumen open at first end cap (5a), second end cap and second tube sheet (3') with lumen of the hollow fibers closed at second end cap (see abstract and column 1, lines 30-59), a perforated tube (8) which is plugged at the first end cap and open to the outside (7) at the second end cap for feed inlet, and a nozzle (9) on the shell for the non-permeate exit. Permeate taken out from the lumen of the hollow fibers through outlet (10).

With respect to the end caps being exclusive to the respective ends, Kuzumoto teaches such exclusivity as claimed and as disclosed by the applicant. See the end caps at both ends of figure 1.

Claims differ Kuzumoto in the hollow fiber fabric and all parts constructed of the same material. Cho teaches a similar membrane cartridge with hollow fiber fabric wound around the perforated tube and that all parts of the cartridge can be made of the same material as shown above. It would be obvious to one of ordinary skill in the art at the time of invention to use the teaching of Cho in the teaching of Kuzumoto because the Cho construction would afford mechanical support for, and uniform spacing between, the hollow fibers, and choice of material as taught by Cho (incorporated reference to Huang) for chemical and temperature resistance for wider range of

applicability. Remaining limitations in the independent claims are intended-use. Cho teaches the limitations in the dependent claims, as explained above.

2. Claims 1,3-8 and 10-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Anderson (US 2003/0154856) in view of Cho et al (US 6,616,841), or in the alternative, Cho in view of Anderson

Anderson teaches a hollow fiber membrane cartridge (30-figure 3) having a perforated center tube (37), hollow fibers (9) open at the first tube sheet (at 6) end and closed at the second tubesheet (12) end, center tube open to fluid flow at second tube sheet (12) through port (15), and plugged at the first tube sheet end (see the description at paragraph 0025), shell has a port (16) for fluid communication to the shell side, end caps (6 and 7) forming first and second head spaces as claimed, the shell is sealed to the end caps and tube sheets (O-rings 3), and permeate outlet through port (14) at the first tube sheet from the first head space. The apparatus is capable of introducing fluid through port (15) in to the shell and removing the retentate through port (16) as claimed. Even if not, the change in direction of flow is not a patentable invention because the flow in the reverse direction as taught in the reference would be equivalent and would provide predictably same results as the in the claimed flow direction. KSR v Teleflex: 82 USPQ 2d 1385 (2007).

Claims differ from the teaching of Anderson in the hollow fiber fabric and the material of shell, end caps, tube sheets, center tube and the plugs being the same. Cho teaches these features, as shown in the paragraph 1 above. It would be obvious to one

of ordinary skill in the art at the time of invention to use the teaching of Cho in the teaching of Anderson for reinforcement/mechanical strength for the hollow fibers, maintaining proper spacing between the fibers, providing chemical resistance, etc.

Claim limitations reciting introducing a gas in to a liquid or degassing a liquid are intended use, which the apparatus is capable of.

Limitations of the dependent claims are taught by the references singly or in combination (see paragraph 1 above).

Alternately, it would be obvious to one of ordinary skill in the art at the time of invention to use the teaching of Anderson in the teaching of Cho to have the Cho cartridge in applications as recited by Anderson. It would also be obvious to one of ordinary skill in the art at the time of invention to reverse the arrangement of the opening (18) of the perforated tube with respect to the open end of the hollow fibers (at 26) of figure 4 of Cho as in the Anderson design because such a change would afford equivalent structures with predictably no difference in the function of the cartridge. See KSR v Teleflex: 82 USPQ 2d 1385 (2007).

Response to Arguments

Applicant's arguments filed 7/23/07 have been fully considered but they are not persuasive.

Arguments are directed at the newly added limitation of the first and second head space, which is addressed in the rejection. Argument that the Kuzumoto apparatus

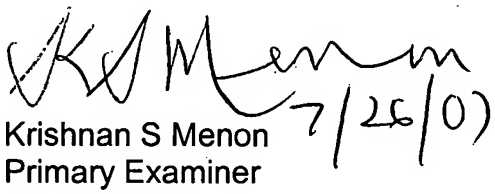
does not provide a head space defined by the end cap and the tube sheet that allows the opening through the end cap to communicate with the center tube via the head space is not persuasive. This is only a minor design change which is within the skill level of one of ordinary skill in the art as recognized by KSR v Teleflex: 82 USPQ 2d 1385 (2007). Moreover, the end cap opening is in communication with the center tube via the second headspace as claimed because the tube passes through the headspace. Also, the headspace can be defined as within the tube portion between the end cap and the tube sheet (3').

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krishnan S. Menon whose telephone number is 571-272-1143. The examiner can normally be reached on 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David R. Sample can be reached on 571-272-1376. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Krishnan S Menon
Primary Examiner
Art Unit 1723